



OHIO DEPARTMENT OF
NATURAL RESOURCES

Fountain Square
Columbus, Ohio 43224
614/265-6305

April 10, 1984

CERTIFIED MAIL
Return Receipt Requested
No. P 476 680 641

Goodyear Atomic Corporation
Gaseous Diffusion Plant
Box 628
Piketon, OH 45661

Dear Sirs:

The Division of Wildlife investigated a fish kill in Big Run Creek in Pike County on October 31, 1983.

It was determined that the stream was degraded and that 5,847 wild animals, mostly fish, were killed as a result of hydrogen imbalanced water entering the stream from the Gaseous Diffusion Plant. It was further found that the loss to the people of the State of Ohio amounted to \$3,372.12.

All wild animals not legally confined are held in trust by the State of Ohio for the benefit of the people by virtue of Section 1531.02 of the Revised Code. Section 1531.04 places upon the Division of Wildlife, through the Chief, the responsibilities for enforcing the laws of the state protecting these wild animals.

Therefore, I respectfully request a check be made payable to the Division of Wildlife in the amount of \$3,372.12 and sent to the Division of Wildlife, Legal Section, Building C, Fountain Square, Columbus, Ohio 43224 for this loss.

If you need additional information on this matter please contact Mr. Jerry Ladd, Division of Wildlife, Law Enforcement Section, Fountain Square, Columbus, Ohio 43224 (Phone: 614-265-7093).

Sincerely,

MAX E. DUCKWORTH
Chief, Division of Wildlife

MED:bb

15L9

LEE,

MR. NAYMIK OF THE EH TEAM WOULD LIKE TO TALK WITH
PERSONNEL WHO WOULD HAVE HISTORICAL REFERENCE
KNOWLEDGE ON THE FOLLOWING TOPICS.

1. FISH / CATTLE KILLS.
2. ACCIDENTAL RELEASES OF ETHYLENE GLYCOL, FREON IN
REPORTABLE QUANTITIES.
3. PCB RELEASES / SPILLS / EXPOSURES.
4. CARWASH / GARAGE MAINT. AREA DISCHARGES (OIL, GAS, DILBOL).
5. SEWAGE TREATMENT PLANT EXCEEDANCES ON DISCHARGE,
OPERATIONS, etc.
6. HISTORICAL RELEASES INTO STORM ~~SEWERS~~ DRAINS, SEWERS.

My thoughts:

1. YOUR ENVIRONMENTAL COMPLIANCE MGR.
2. YOUR GARAGE SUPERVISION.
3. HARRIS COOK FOR PCBs.
4. DICK ARMSTRONG FOR SEWAGE TREATMENT, STORM DRAIN.

My Phone: 3873 MY BEEPER 289-0901

HE WILL GO TO THEM IF NECESSARY, OR THEY CAN COME
TO THE X-7725 FOR INTERVIEWS.

Thanks Lee

Tom Marnell

GR29
2221

MEMORANDUM OF CONFERENCE OR CONVERSATION

Date (1) 4/11/94	Time (2) 10:00 - 11:00 a	(3) <input type="checkbox"/> TELEPHONE <input checked="" type="checkbox"/> PERSONAL
ORIGINATING PARTY		OTHER PARTIES
(4) Frank Homershy, Jason Patrick		Tessie Hall, 643 Big Run Road 8995 E Main St
Subject (6) Report to Management of 4 dead cows. (Reynoldsburg 614-866-6361) Tanny Miller DR. ALLEN - 947-5025		
Discussion (7) Jason & I visited farm. Ms Hall claims she has lost 3 calves and was about to lose a cow. She had already buried the 3 calves. Two of the calves were bought at auction (Jersey breed) 1-2 wks old, and the other was from another cow shown in picture. The original calf of the sick cow is apparently OK and was in the barn, however, we did not see her. Ms Hall alluded to the fact that her animals as well as other neighbors animals were dying from drinking Big Run Creek water although access to Big Run is a considerable distance from the farm's barn lot and other spring water was available near the barn. The cow shown in picture was unable to stand. Ms Hall stated that Doc Allen had treated cow but was unable to determine cause of sickness. I recommended to Ms Hall that an autopsy be done if the cow dies and that she should call us when it does. I later called Ohio State Animal Industry clinic in Reynoldsburg to discuss autopsy arrangements. I also discussed cow & calves with Conclusion Or Agreements (8) Dr. Allan who stated he had treated calves for colds, worms & lice. He had also treated cow Monday am. He indicated that cow could still survive. I also received a call from Sally Averill, USEPA who wanted details of my visit. Dr. Allen also indicated Sally had called him earlier.		

Distribution
Sandy Fout Jason Patrick

Ken Tomko

Doug Scott

Signed

(9)

Frank Homershy

MEMORANDUM OF CONFERENCE OR CONVERSATION

Date (1) 4/20/94	Time (2) 9:30	(3) <input type="checkbox"/> TELEPHONE <input checked="" type="checkbox"/> PERSONAL
ORIGINATING PARTY		OTHER PARTIES
(4) Frank Horneusky		Tessie Hall
Mary Delay		
Robert Blythe		
Subject (6) Report of dead cow at Tessie Hall Farm, 643 Big Run Rd.		

Discussion

(7) Tessie Hall had called the previous afternoon (4/19/94) to report that the sick cow we had visited on 4/11/94 had died. Arrangements had been previously made with Dr. Allen Vet, and Ohio State, Division of Animal Industry @ Reynoldsburg to have an autopsy conducted. With the help of Mary & Robert, the cow was loaded into a pickup and delivered to Reynoldsburg @ 1:00pm. The receiving technician stated that the cow had obviously been dead greater than 24 hours & that they recommend autopsies on less than 24 hour dead animals, especially during warm weather. They accepted the cow and stated that a report would be completed in about 1 month. Copies would be sent to Dr. Allen, vet, T. Hall, owner, and myself @ PORTS

Conclusion Or Agreements

(8)

Report expected in about 1 month.

Distribution

Sandy Fout
Ken Tomlin
RC Dave Goff

Tamara Patrick
Robert Blythe
Mary Delay

Signed
(9)

Frank Horneusky

MEMORANDUM OF CONFERENCE OR CONVERSATION

Date (1) 4/25/94	Time (2) 1:15 pm	(3) <input type="checkbox"/> TELEPHONE <input checked="" type="checkbox"/> PERSONAL
ORIGINATING PARTY		OTHER PARTIES
(4) Frank Hammersly Jason Patrick		T. Hall

Subject
(6) Follow-up to report of a second sick cow (4-24-94 Rpt.)

Discussion
(7) Jason & I visited the second sick cow @ T. Hall's farm @ 643 Big Run Rd. Mrs. Hall stated that this cow calved 4 days ago on pasture and was unable to stand. They transported cow from the pasture to the barn.
In our opinion, this cow looked healthy except that she was paralyzed in the hind legs and was unable to stand. The symptoms of the cow that died and this cow did not appear similar.

T. Hall agreed to keep us posted on the cow's condition. I also advised Mrs. Hall that the autopsy of the cow delivered to Reynoldsburg on 4/20/94 would be completed in about a month.

Conclusion Or Agreements

(8)

Distribution

Sandy Fout
Ken Tomlin
Dorothy C. H.

Jason Patrick
Robert Blythe
Mary Delay

Signed

(9)

Frank Hammersly J

MEMORANDUM OF CONFERENCE OR CONVERSATION

Date (1) 5/10/94	Time (2) 13:40	<div style="display: flex; justify-content: space-between;"> (3) <input checked="" type="checkbox"/> TELEPHONE <input type="checkbox"/> PERSONAL </div>
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ORIGINATING PARTY

OTHER PARTIES

(4) Frank Homersley

T. Hall

Subject

(6) T. Hall's report of second sick cow - Followup to 4/24 and 4/25 memo's

Discussion

(7) Per D. Scott's request, I called T. Hall to find out if she received a copy of the autopsy report. She had and also stated that the second cow and another calf had also died of this same strange illness. She indicated that yes the first cow had pneumonia but developed that after being down for so many days in the rain and mud. Again, she indicated that the vet (not Dr. Allen) provided treatment to the second cow but could not determine the cause of death.

She indicated that her attorney advised her to obtain an independent evaluation of the cow to determine cause of death. She said that they had already buried the second cow.

Conclusion Or Agreements

(8) I thanked her and told her I would appreciate being notified if she continued having similar problems.

Distribution
Sandy Fort
Ken Fort
D. Scott

Jason Patrick
Robert Blithe
Mary Delay

Signed
(9)

Frank Homersley

OHIO DEPARTMENT OF AGRICULTURE
DIVISION OF ANIMAL INDUSTRY
DIAGNOSTIC SERVICE LABORATORIES
REYNOLDSBURG, OHIO 43068

Protocol No. 11691

Date Received: 4/20/94

Veterinarian: J. R. Allen, Jr.

Date Reported: 5/3/94

Owner: Tessie Hall

Specimen submitted: One Holstein cow

Necropsy:

- Animal was thin with little body fat.
- Skin had multiple excoriations on the sternal areas and left-rear limb and foot (possibly from the animal being down).
- Severe autolysis to the tissues.
- Severe anteroventral consolidation of approximately 50% of the right lung lobes and approximately 40% to the left lung lobes. Adjacent areas to the affected lung lobes had severe pleural adhesions from the lung surfaces to the thoracic cavity. The affected lung lobes had severe multifocal 1-5 cm abscesses.
- Rumen contained vegetative matter and grain (oats and corn).
- No significant changes within the intestinal tract that could not be differentiated from autolysis.
- Severe autolysis precludes any other histological or virological testing.

Bacteriology:

Moderate growth of Pasteurella haemolytica A. in lung.

Antibiogram is enclosed.

Salmonella sp. not found.

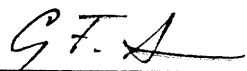
Diagnosis:

Pneumonia

Pleuritis

Comments:

P. haemolytica A was isolated from the pneumonic lungs.



Craig F. Sarver, D.V.M.
Veterinary Diagnostician
Pathology Section

CFS:sl

cc: Tessie Hall

cc: Frank Homerosky

REPORT ON WATER QUALITY
BASED EFFLUENT LIMITS

U.S. DOE PIKETON
OHIO NPDES #:01000000/USEPA #:0H0006092

Ohio Environmental Protection Agency
Division of Water Quality Monitoring and Assessment

April 19, 1988

Ray Beaumier through Dan Dudley

Distribution

Bob Phelps
John Morrison
Maan Osman
Seif Amragy
Pat Abrams

Bob Heitzman (Stream Use Info. only)
Stream System File 02-001 (Scioto River) Toxics Report File

Water Quality Based Effluent Limits (WQBEL) for U.S. DOE-Piketon, is a report of the Division of Water Quality Monitoring and Assessment (DWQMA) at the Ohio EPA to assist in the development of permit limits for this entity. Stream use designations, factors evaluated in the risk assessment of environmental hazards (Table 1), recommended limits along with an assessment of the risk associated with water quality based parameters (Table 2, text), and supporting material (Tables 3-6, biomonitoring language, stream use fact sheets, WLA values) are provided. Raw data and analyses are kept in DWQMA's files for technical justification.

STREAM USE DESIGNATIONS

Receiving Stream Network: U.S. DOE-Piketon outfalls 001, 005-009 and 011 discharge to Little Beaver Creek. The remaining stream network is Little Beaver Creek to Big Beaver Creek to the Scioto River to the Ohio River. Outfall 002 discharges to Big Run. Outfalls 010 and 013 discharge to West Ditch. Outfall 012 discharges to Piketon-DOE Tributary. Big Run, West Ditch, and Piketon-DOE Tributary are all direct tributaries of the Scioto River. Outfalls 003 and 004 directly discharge to the Scioto River.

Little Beaver Creek (Ohio EPA Stream System #:02-023, USEPA River Reach #:05060002-NA). Little Beaver Creek is presently designated for the following uses: Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS) and Primary Contact Recreation (PCR). The field survey conducted during 1985 confirmed the above uses are appropriate.

Big Beaver Creek (Ohio EPA Stream System #:02-022, USEPA River Reach #:05060002-018). Big Beaver Creek is presently designated for the following uses: WWH, AWS, IWS and PCR. The field survey conducted during 1985 confirmed the above uses are appropriate.

Big Run (Ohio EPA Stream System #:02-012, USEPA River Reach #:05060002-012). Big Run is presently designated for the following uses: WWH, AWS, IWS and PCR. Big Run has not been evaluated by a field survey; therefore, the existing uses should be retained.

West Ditch (Ohio EPA Stream System #:02-247, USEPA River Reach #:05060002-NA). West Ditch is presently undesignated in the Ohio Water Quality Standards. This stream flows into the Scioto River at RM 25.2. Proposed uses for West Ditch are Nuisance Prevention (NP), AWS, IWS and Secondary Contact Recreation (SCR). A Stream Use Fact Sheet is provided for justification in the attachments.

Piketon-DOE Tributary (Ohio EPA Stream System #:02-248, USEPA River Reach #:05060002-NA). Piketon-DOE Tributary is presently undesignated in the Ohio Water Quality Standards. This stream flows into the Scioto River at RM 25.0. Proposed uses for the Piketon-DOE Tributary are NP, AWS, IWS and SCR. A Stream Use Fact Sheet is provided for justification in the attachments.

Table 1. Factors evaluated in the risk assessment of the environmental hazards associated with water quality based parameters in U.S. DOE-Piketon outfalls.

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1. Aquatic Life Water Quality Criteria/Standards
 2. Water Quality Criteria/Standards Assumptions
 3. WLA
 4. Modeling Procedures and Assumptions
 5. Effluent and Instream Chemical Evaluation (solids, oxygen demanding substances, nutrients, metals)
 6. Effluent Chemical Evaluation (GC/MS organic compounds)
 7. Effluent and Instream Bioassays (Battelle 1978; U.S. EPA March, 1987)
 8. Instream fish community biosurvey
 9. Effluent Characterization: a)MOR Data
 10. Current Permit Limits
 11. Reported Fish Kills and Chemical Spills
-

RISK ASSESSMENT STATEMENTS

I. ENVIRONMENTAL HAZARD ASSESSMENT

No instream macroinvertebrate or chemical surveys were conducted on any tributaries into which DOE-Piketon discharges. A fish survey was conducted on Little Beaver Creek, Big Beaver Creek and the Scioto River and a chemical survey on the Scioto River during 1985.

No significant impairment to the fish community occurred in Little Beaver Creek or Big Beaver Creek. U.S. EPA bioassays conducted in March 1987 on outfall 001 revealed no significant mortality to fathead minnows. An LC50 of 15.7% effluent for Daphnia pulex was calculated for outfall 001. Process water entering Little Beaver Creek via outfall 001 will be discontinued by April, 1989.

The fish community in the Scioto River was slightly impaired upstream and downstream from the DOE-Piketon outfalls; the slight impairment is a continuation of an upstream impact with no influence due to DOE-Piketon discharges. Results of U.S. EPA bioassays conducted in March 1987 on outfall 003 revealed no significant mortality to fathead minnows or Daphnia pulex. The Scioto River Water Chemistry Survey revealed instream grab samples were well within Water Quality Criteria for nutrients and metals with no significant influence due to DOE-Piketon discharges.

II. RISK ASSESSMENT OF WATER QUALITY BASED PARAMETERS

Suggested water quality based limits to protect against an environmental hazard are summarized in Table 2. Both concentrations and loadings are provided so the permit writer can use the appropriate measures. The suggested limits protect against both acute and chronic toxic effects.

Limits for outfall 002 are based on antidegradation, monthly operating report (MOR) data, and the wasteload allocation (WLA). No biosurvey, bioassay or instream chemical survey were conducted in Big Run. Monthly operating report (MOR) data documents copper and zinc at concentrations that could be expected to impact aquatic life. Arsenic was not found present in outfall 002 except in less than 5% of the MOR data so monitoring is the recommended control measure. Nickel limits were developed based on MOR data and the WLA-antidegradation procedure. The copper limit is presented as the maximum WLA value because a significant long term average can not be calculated without at least eight monthly samples. Similarly, zinc is presented as a maximum limit which is twice the chronic WLA per administrative policy.

Nickel limits are provided for outfall 003 based on the antidegradation policy. Limits for copper, nickel, and zinc in outfall 604 are also based on the antidegradation policy.

No MOR data is available for outfall 606 which is groundwater contaminated by the 601 process water outfall which will cease operation in March, 1989. Recommend limits for cadmium, hexavalent chromium, total chromium, copper, lead, nickel and zinc in outfall 606 are Final Acute Values (FAV). The trichloroethylene limit is based on BPJ provided by the permit writer.

Limits for ammonia, total chromium, copper, nickel, and zinc in outfall 605 were based on BPJ provided by the permit writer which was more stringent than the WLA. Hexavalent chromium limits were based on the FAV. Trichloroethylene monitoring is also recommended.

Limits for outfall 004 were developed by combining the present operating conditions or the WLA at 004 with the additional contributions from outfall 605 when it comes online in April, 1989. Hexavalent chromium, total chromium, copper, and zinc limits were developed based on combining the current antidegradation limits for outfall 004 with the additional contribution from outfall 605. Monitoring for nickel and trichloroethylene is also recommended.

Whole Effluent Limits

A U.S. EPA bioassay of outfall 001 in March, 1987 resulted in an LC50 of 15.7 % effluent to Daphnia pulex. The 601 process water was routed to 001. Characteristics of the new treatment system process water (outfall 605) is unknown and will be routed to outfall 004. After the 605 outfall is on line monthly acute bioassays should be conducted on outfall 004 for a period of one year. Chronic toxicity is not a concern with dilution of 190 to 1 in the Scioto River. Details of the recommended biomonitoring program are provided in the Risk Assessment Attachments.

Table 2. Suggested Water Quality Based Limits to protect against an environmental hazard. These limits were developed using a Risk Assessment Approach and Ohio EPA policies and procedures.

Parameter	Current Environmental Hazard	Acceptable Risk (Suggested limit to protect against an environmental hazard)	Justification For The Acceptable Risk
<u>OUTFALL 002</u>			
Arsenic, T. (ug/l)	No impact on aquatic life is currently suspected or documented	Monitor only	MOR data
Copper, T.R. (ug/l)	Theoretical potential for an impact on aquatic life exists	Max.=43 ug/l, 0.065 kg/d	WLA, Admin. Policy
Nickel, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Avg.=82 ug/l, 0.124 kg/d Max.=122 ug/l, 0.185 kg/d	WLA-Antideg. Procedure WLA-Antideg. Procedure
Zinc, T.R. (ug/l)	Theoretical potential for an impact on aquatic life exists	Max.=362 ug/l, 0.549 kg/d	WLA, Admin. Policy
<u>OUTFALL 003</u>			
Nickel, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Avg.=77 ug/l, 0.070 kg/d Max.=102 ug/l, 0.111 kg/d	WLA-Antideg. Procedure WLA-Antideg. Procedure
<u>OUTFALL 604</u>			
Copper, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Avg.=23 ug/l, 0.003 kg/d Max.=35 ug/l, 0.005 kg/d	WLA-Antideg. Procedure WLA-Antideg. Procedure
Nickel, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Avg.=30 ug/l, 0.004 kg/d Max.=44 ug/l, 0.006 kg/d	WLA-Antideg. Procedure WLA-Antideg. Procedure
Zinc, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Avg.=299 ug/l, 0.044 kg/d Max.=440 ug/l, 0.065 kg/d	WLA-Antideg. Procedure WLA-Antideg. Procedure

Table 2. Continued.

Parameter	Current Environmental Hazard	Acceptable Risk (Suggested limit to protect against an environmental hazard)	Justification For The Acceptable Risk
<u>OUTFALL 606</u>			
Cadmium, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Max.=212 ug/l, 0.003 kg/d	Final Acute Value (FAV)
Hex. Chrom., diss. (ug/l)	No impact on aquatic life is currently suspected or documented	Max.=38 ug/l, 0.001 kg/d	FAV
Total Chrom., T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Max.=7832 ug/l, 0.089 kg/d	FAV
Copper, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Max.=86 ug/l, 0.001 kg/d	FAV
Lead, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Max.=684 ug/l, 0.008 kg/d	FAV
Nickel, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Max.=6134 ug/l, 0.070 kg/d	FAV
Zinc, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Max.=1416 ug/l, 0.016 kg/d	FAV
Trichloroethylene (ug/l)	No impact on aquatic life is currently suspected or documented	Max.=110 ug/l	BPJ
<u>OUTFALL 004</u>			
Hex. Chrom., diss. (ug/l)	No impact on aquatic life is currently suspected or documented	Avg.=15 ug/l, 0.068 kg/d Max.=38 ug/l, 0.001 kg/d	WLA-Antideg. Proc., BPJ WLA-Antideg. Proc., BPJ
Total Chrom., T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Max.=204 ug/l, 0.930 kg/d	BPJ

Table 2. Continued.

Parameter	Current Environmental Hazard	Acceptable Risk (Suggested limit to protect against an environmental hazard)	Justification For The Acceptable Risk
<u>OUTFALL 004 - Continued</u>			
Copper, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Avg.=63 ug/l, 0.287 kg/d Max.=86 ug/l, 0.391 kg/d	WLA-Antideg. Proced., BPJ FAV
Nickel, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	monitor only	BPJ
Zinc, T.R. (ug/l)	No impact on aquatic life is currently suspected or documented	Avg.=268 ug/l, 1.219 kg/d Max.=387 ug/l, 1.760 kg/d	WLA-Antideg. Proced., BPJ WLA-Antideg. Proced., BPJ
Trichloroethylene (ug/l)	No impact on aquatic life is currently suspected or documented	Monitor Only	BPJ
<u>OUTFALL 605</u>			
Ammonia-N, T.	New treatment facility impact on aquatic life presently unknown	Avg.=0.4 mg/l, 0.060 kg/d Max.=4.4 mg/l, 0.670 kg/d	BPJ BPJ
Hex. Chrom., diss. (ug/l)	New treatment facility, impact on aquatic life presently undetermined.	Max.=38 ug/l, 0.006 kg/d	FAV
Total Chrom., T.R. (ug/l)	New treatment facility, impact on aquatic life presently undetermined.	Avg.=46 ug/l, 0.007 kg/d Max.=92 ug/l, 0.014 kg/d	BPJ BPJ
Copper, T.R. (ug/l)	New treatment facility, impact on aquatic life presently undetermined.	Avg.=593 ug/l, 0.090 kg/d Max.=1187 ug/l, 0.180 kg/d	BPJ BPJ
Nickel, T.R. (ug/l)	New treatment facility, impact on aquatic life presently undetermined.	Avg.=1781 ug/l, 0.270 kg/d Max.=3562 ug/l, 0.540 kg/d	BPJ BPJ
Zinc, T.R. (ug/l)	New treatment facility, impact on aquatic life presently undetermined.	Avg.=330 ug/l, 0.050 kg/d Max.=594 ug/l, 0.090 kg/d	BPJ BPJ
Trichloroethylene (ug/l)	New treatment facility, impact on aquatic life presently undetermined.	Monitor Only	BPJ

Priority Pollutant Organics Analyses Summary

Changes in DOE-Piketon's treatment facilities have influenced effluent quality. The 1988 2C Information is reflective of current treatment facilities and was used to assess the GC/MS organic compounds detected. Seven GC/MS organic compounds were detected at the various DOE-Piketon outfalls (Table 5). Two compounds, Bromoform and Di-N-Butyl Phthalate, were detected at less than 10% of the Chronic Aquatic Criteria (CAC, [Table 3]) at all outfalls. Chloroform was found at less than 10% of the wasteload allocation (WLA) at all outfalls. Trichloroethylene was present at less than 10% of the CAC except at outfall 001 where it was slightly above 10% of the CAC. Process water will not be routed through outfall 001 after March, 1989. No criteria have been developed for Bromodichloromethane and Dibromochloromethane but these compounds were detected at less than 6.6 ug/l in all outfalls. No chemical specific controls are recommended for the above organic compounds. Trichloroethylene should be monitored at outfalls 004, 605, and 606.

Fish Kills and Chemical Spills

The Ohio Department of Natural Resources Fish Kill Records from 1970 to 1986 contained eight fish kill investigations at the DOE-Piketon facility where no dead fish were found. On October 31, 1983, a fish kill due to a Sodium Hydroxide spill, killed approximately 5,847 fish in Big Run.

The Ohio EPA Emergency Response Records from 1978 to 1988 contained 23 incidences of reported spills due to DOE-Piketon. Six of the reported spills affected watercourses adjacent to DOE-Piketon. Materials commonly spilled were uranium hexafluoride, PCB oil, and sodium hydroxide. Other materials spilled include road binder, chlorine wash water, ferric sulfate, gasoline, mercury, freon 114, sulfuric acid, trichloroethylene, uranium, and lube oil.

U.S. DOE-PIKETON

RISK ASSESSMENT ATTACHMENTS/TECHNICAL SUPPORTING MATERIAL

Table 3. Chronic Aquatic Criteria (CAC) - the highest concentration that should not cause unacceptable toxicity during a long term exposure and Acute Aquatic Criteria (AAC) - The highest short term concentration that should not result in unacceptable effects on aquatic organisms and their uses. Metal criteria are based on the typical instream hardness during the 1985 field survey of 250 to 350 mg/l. Ammonia criteria is based on the pH range of 8.0 to 9.0 and the temperature range of 15 - 27 degrees C. This Criteria Table was developed for comparison with the instream water chemistry data and is not used in the WLA process. Values are in ug/l unless otherwise noted.

Parameter	CAC	AAC
Ammonia-N, T. (mg/l)	0.2-2.3	0.7-8.5
Hexavalent Chromium, T.	10	19
Trivalent Chromium, T.R.	67-83	3290-4340
Copper, T.R. (Ohio Criteria)	11-14	36-49
Lead, T.R.	30	262-403 ^a
Nickel, T.R.	268-341	2530-3450
Zinc, T.R.	152-201	596-788
Cadmium, T.R.	1.4-1.9	83-123
Cyanide, free	8.1	38
Arsenic, T.R.	190	360
Bromoform	1000	1500
Chloroform	79	1800
1,1,1-Trichloroethane	88	2000
Trichloroethylene	75	1700
Di-N-Butyl Phthalate	190	350
Bromodichloromethane	--b	--b
Dibromochloromethane	--b	--b

^a Acute lead criteria based on U.S. EPA criteria document (1984).

^b -- = Insufficient data to calculate criterion.

Table 4. Summary of the analyses of the samples collected in the Scioto River upstream from Big Beaver Creek (River Mile [RM] 29.2), downstream from Big Beaver Creek (RM 26.9), downstream from DOE-Piketon's 003 and 004 outfalls (RM 25.0) and downstream from Big Run (RM 20.5). Samples were collected during the 1985 Ohio EPA Field Survey. Concentrations are in ug/l unless otherwise noted. n = number of samples; K = less than; NA = not analyzed.

Parameter	Upstream from Big Beaver Creek	Downstream from Big Beaver Creek	Downstream from DOE's outfalls	Downstream from Big Run
	RM 29.2	RM 26.9	RM 25.0	RM 20.5
	n / mean / range	n / mean / range	n / mean / range	n / mean / range
Temperature (C)	6/21.4/15.0-27.5	6/21.3/15.0-27.5	6/21.3/14.0-27.0	5/21.0/15.5-24.5
D. O. (mg/l)	6/9.3/8.0-10.7	6/8.8/7.5-10.6	6/9.1/7.9-10.0	5/8.9/5.7-11.8
pH (S.U.)	6/8.5/7.8-9.2	6/8.5/8.0-9.0	6/8.5/8.0-9.0	5/8.4/8.0-9.0
Ammonia-N, T. (mg/l)	6/0.08/K0.05-0.14	6/0.05/K0.05-0.07	6/0.09/K0.05-0.24	5/0.14/K0.05-0.48
Hardness, T. (mg/l)	6/353/259-569	6/309/259-326	6/312/260-335	5/322/261-353
Arsenic, T.	6/2.7/K2-4	6/2.7/K2-5	6/2.7/K2-4	5/3.0/K2-4
Cadmium, T.	6/0.2/k0.2-0.4	6/0.2/k0.2-0.4	NA	5/0.2/k0.2-0.3
Total Chrom., T.	6/K30/K30	6/K30/K30	6/K30/K30	5/K30/K30
Copper, T.	6/3/2-5	6/10/1-45	6/3/2-4	5/3/2-5
Lead, T.	6/3/K2-4	6/3/K2-4	6/3/K2-5	5/3/K2-6
Nickel, T.	6/43/K40-60	6/43/K40-60	6/k40/k40	5/k40/k40
Zinc, T.	6/18/K10-25	6/17/K10-25	6/19/K10-30	5/20/15-25

Table 5. Concentrations (ug/l) of chemicals found present in Priority Pollutant GC/MS Organic Chemical Analyses of U.S. DOE-Piketon wastewater from the 1988 2C Form. ND = not detected.

Parameter	001 outfall	601 outfall	002 outfall	003 outfall	604 outfall	004 outfall	011 outfall
Bromoform	2	ND	ND	ND	ND	ND	ND
Chloroform	5	2	ND	ND	2	8.2	2
Trichloroethylene	11	2.5	ND	2.9	2	ND	ND
Di-N-Butyl phthalate	ND	ND	5.8	ND	4.8	3.9	2.0
Bromodichloromethane	5.3	2.0	ND	ND	2.0	ND	2.0
Dibromochloromethane	6.5	2.3	ND	ND	2.0	ND	2.0

Table 6. U.S. DOE-Piketon current permit limits and a summary of the monthly operating report data for 1985, 1987, and 1984-87. Values are in ug/l unless otherwise noted; n = number of analyses.

Parameter	Current Permit Limits 30 day daily	1985				1987				1984-1987			
		n	50th.	95th.	Range	n	50th.	95th.	Range	n	50th.	95th.	Range
			%ile	%ile			%ile	%ile					
<u>Outfall 002 (outfall 602=coal pile runoff, boiler blowdown, rainfall runoff)</u>													
Arsenic, T.	monitor only	22	0.0	0.0	0.0	35	0.0	0.0	0.0	100	0.0	0.0	0.0-20
Copper, T.	monitor only	22	40	1480	0-2800	35	50	180	0-390	130	40	370	0-2800
Nickel, T.	monitor only	22	30	80	0-190	35	20	40	0-60	100	30	70	0-190
Zinc, T.	monitor only	22	140	1520	80-1880	35	170	390	80-610	100	200	780	70-1880
<u>Outfall 003 (outfall 604=decontaminated acid wastes, outfall 606=contaminated ground water, sanitary wastes)</u>													
BOD ₅	28.9 44.0	26	1	3	0-3	35	3	6	1-42	156	2	5	0-42
Fecal Coli./100ml	1000 2000	27	10	1844	0-4630	34	8	738	0-3620	155	5	738	0-4630
cel, T.	monitor only	26	40	90	20-340	35	20	30	0-40	156	40	130	0-340

Table 6. Continued.

Parameter	Current Permit Limits 30 day daily	1985				1987				1984-1987			
		n	50th.	95th.	Range	n	50th.	95th.	Range	n	50th.	95th.	Range
			%ile	%ile			%ile	%ile					
<u>Outfall 004 (cooling water blowdown, 605=process water will be routed to this outfall after March, 1989)</u>													
Hex. Chromium, T.	monitor only	25	0	10	0-10	35	0	10	0-10	151	0	20	0-40
Total Chromium, T.	monitor only	25	110	680	30-1670	35	30	250	0-530	151	80	900	0-2200
Copper, T.	monitor only	25	20	40	0-50	35	0	30	0-40	151	20	50	0-130
Zinc, T.	monitor only	25	110	430	50-540	35	80	170	50-200	151	100	430	30-170
Trichloroethylene	monitor only	25	0	0	0	35	0	1	0-9	120	0	0	0-20
<u>Outfall 601 (decontamination process water until March 31, 1989)</u>													
Ammonia-N, T. (mg/l)	monitor 2/wk.	50	0.2	1.4	0-5.1	69	0.2	1.1	0-1.5	307	0.2	1.6	0-78
Hex. Chromium, T.	monitor 2/wk.	50	0	10	0-10	69	0	20	0-40	307	0	10	0-40
Total Chromium, T.	62 123	50	0	70	0-100	69	20	90	0-380	306	20	70	0-830
Copper, T.	monitor 2/wk.	50	60	250	0-770	69	40	210	0-900	306	70	330	0-1600
Nickel, T.	monitor 2/wk.	50	220	650	110-1350	69	180	1300	70-2980	306	260	1070	0-2980
Zinc, T.	440 792	50	120	770	60-1270	69	100	720	40-1510	306	180	810	0-4830
Trichloroethylene	monitor 2/wk.	51	140	440	20-1490	69	33	98	0-120	309	91	750	0-3200
<u>Outfall 602 (coal pile runoff)</u>													
Arsenic, T.	monitor 1/wk.	16	0	110	0-110	29	0	30	0-40	101	0	70	0-400
Copper, T.	monitor 1/wk.	16	100	350	60-440	29	20	120	0-150	101	60	300	0-1000
Nickel, T.	monitor 1/wk.	16	140	460	80-370	29	60	160	0-250	101	90	380	0-1520
Zinc, T.	monitor 1/wk.	16	400	1680	140-2040	29	270	1950	80-2040	101	270	2040	80-480
<u>Outfall 604 (decontaminated acid wastes)</u>													
Copper, T.	46 92	24	0	80	0-110	69	0	20	0-60	191	0	50	0-120
Nickel, T.	119 238	24	20	100	0-150	69	0	30	0-40	191	20	70	0-280
Zinc, T.	363 726	24	160	720	70-1150	69	140	450	50-1280	191	170	650	40-1280

U.S. DOE-PIKETON
SUGGESTED BIOMONITORING PERMIT LANGUAGE PAGE 1

Within three months after the new treatment system (internal outfall 605) is on line, the entity shall initiate an effluent biomonitoring program to determine the toxicity of outfall 004.

Testing Requirements:

Acute Bioassays:

The entity shall conduct monthly 48-hour acute bioassays using Ceriodaphnia and 96-hour acute bioassays using fathead minnow (Pimephales promelas) for a period of one year. The tests shall be conducted using 24-hour composite samples of final effluent from outfall 004. In addition, a grab sample collected within the effluent plume shall be tested. See item 4 under testing protocol for specifics on sampling locales.

3. Chemical Analysis:

Chemical sampling must accompany each water sample taken for bioassay analysis. Bioassay water sampling may be coordinated with other permit sampling requirements as appropriate to avoid duplication. The analyses detailed in the Final Effluent Limitations and Monitoring Requirements tables should be conducted for the water sample. In addition alkalinity and hardness (as CaCO_3) should also be measured. Chemical analysis must comply with Ohio EPA accepted procedures.

Testing Protocol

1. The test shall be conducted using procedures contained in the Ohio EPA Quality Assurance Manual (or current revisions). Any request to use a different methodology must be approved by the OEPA prior to the initiation of testing.
2. The permittee shall determine a median lethal concentration (LC_{50}) and/or medial effective concentration (EC_{50}) for acute bioassays for each test species.
3. A minimum of 5 effluent concentrations (eg. 100, 56, 32, 19, and 10 percent by effluent volume) shall be used in each effluent bioassay. Dilution and control water shall be collected as a grab sample at a site upstream of the outfall (outside the zone of effluent and receiving water interaction). Reconstituted water or rearing unit water (water in which the test organisms were reared) shall be used as a second dilution and control water in the event that receiving stream water as described above shows signs of toxicity. If, in both controls (rearing and ambient), more than 10 percent of the test organisms die in 96 hours, or more than 20 percent of the test organisms die in 7 days that test (control and effluent) shall be repeated.
4. Testing of ambient water shall be conducted as follows. In conjunction with the acute tests of the effluent, the instream grab sample should be collected at a point located within the effluent plume 3.75 meters (12.4 feet) downstream from the 004 outfall discharge to the Scioto River. The location of the effluent plume should be confirmed at the time of sampling using temperature or conductivity measurements. Bioassays of these instream samples will determine if a near field impact is occurring.

U.S. DOE-PIKETON
SUGGESTED BIOMONITORING PERMIT LANGUAGE

PAGE 2

Reporting:

All bioassay results shall be submitted in duplicate to the Ohio EPA Central Office no later than 60 days following the sampling date. One copy shall be routed to the Division of Water Pollution Control - Industrial Wastewater Section and one copy shall be routed to The Division of Water Quality Monitoring and Assessment - Water Quality Appraisal Group.

Results shall be reported for acute bioassays include:

1. Name of testing laboratory.
2. Effluent tested and source.
3. Receiving water used.
4. Date and times of sample collection.
5. Collector(s) names(s)
6. Type of bioassay.
7. Test organisms used.
8. Test organisms origin and acclimation process.
9. Number of organisms per container and per concentration.
10. Test containers size, number per concentration, and depth of test solution.
11. Concentrations tested and volume.
12. Test temperature.
13. Results of chemical analyses.
14. Results of physiochemical measurements taken.
15. Definition of adverse effects measured in the test (endpoints).
16. Number of organisms in each concentration showing the adverse effects at specified times.
17. Median lethal concentrations and/or the median effective concentrations at 24, 48, 72 and 96 hours, and confidence limits, and methods used for these calculations.
18. Any other relevant information.

Data Review:

Following completion of each monthly bioassay tests the entity shall forward the results to Ohio EPA. Based on Ohio EPA's review of the results this permit may be modified to require additional biomonitoring, require a Toxicity Reduction Evaluation, or contain whole effluent toxicity limits.

U.S. DOE-PIKETON
RISK ASSESSMENT ATTACHMENTS/TECHNICAL SUPPORTING MATERIAL

STREAM USE FACT SHEET FOR WEST DITCH

Water Body: West Ditch from its source (River Mile [RM] 2.2) to the mouth (RM 0.0). West Ditch flows into the Scioto River at RM 25.2.

Existing Use: West Ditch has not been previously evaluated for an aquatic life use.

Proposed Use: The proposed aquatic life use for West Ditch is Nuisance Prevention.

Rationale:

-Flow Regime: West Ditch is depicted as an intermittent water course on the U.S.G.S. 7.5 Minute Series Topographical Map. U.S. DOE Piketon outfalls 010 and 013 are located at the source of this tributary and provide 0.46 and 0.41 cfs per day, respectively, of noncontact cooling water.

-Gradient: averages 45 feet/mile

-Length: 2.2 miles

-Drainage Area: approximately 2.5 square miles

-Sinuosity: approximately 1.2

-Amount of deciduous riparian vegetation: Analysis based on U.S.G.S. 7.5 Minute Series Topographical Maps revealed 82% of the stream corridor has no tree canopy. The Pike County Soil Survey has not been completed so aerial photographs and soil types are not readily available.

West Ditch can not be expected to support a truly balanced reproducing warmwater biological community due to its physical characteristics. Without the cooling water from the U.S. DOE Piketon outfalls, West Ditch would be a typical watercourse providing drainage to the rolling terrain in Pike County during rainfall events but otherwise intermittent or dry. The watercourse is very small and has a high gradient so little or no run or pool area would be available for fish habitat, sinuosity is low which decreases habitat suitability, and a tree canopy is generally lacking further decreasing habitat suitability and thermal stability. Therefore, habitat conditions in West Ditch are not suitable to support a warmwater habitat use.

Other Use Designations

The potential for Agricultural and Industrial Water Supply Uses exist; therefore, West Ditch should be designated for these stream uses. Because this tributary is very shallow and pools of sufficient depth for full body immersion (i.e., at least 3 ft. deep over an area of 100 sq. ft., WQS Implementation Manual 1985) will not exist, Secondary Contact Recreation is the appropriate recreational use.

U.S. DOE-PIKETON
RISK ASSESSMENT ATTACHMENTS/TECHNICAL SUPPORTING MATERIAL

STREAM USE FACT SHEET FOR PIKETON-DOE TRIBUTARY

Water Body: Piketon-DOE Tributary from its source (River Mile [RM] 1.2) to the mouth (RM 0.0). Piketon-DOE Tributary flows into the Scioto River at RM 25.0.

Existing Use: Piketon-DOE Tributary has not been previously evaluated for an aquatic life use.

Proposed Use: The proposed aquatic life use for Piketon-DOE Tributary is Nuisance Prevention.

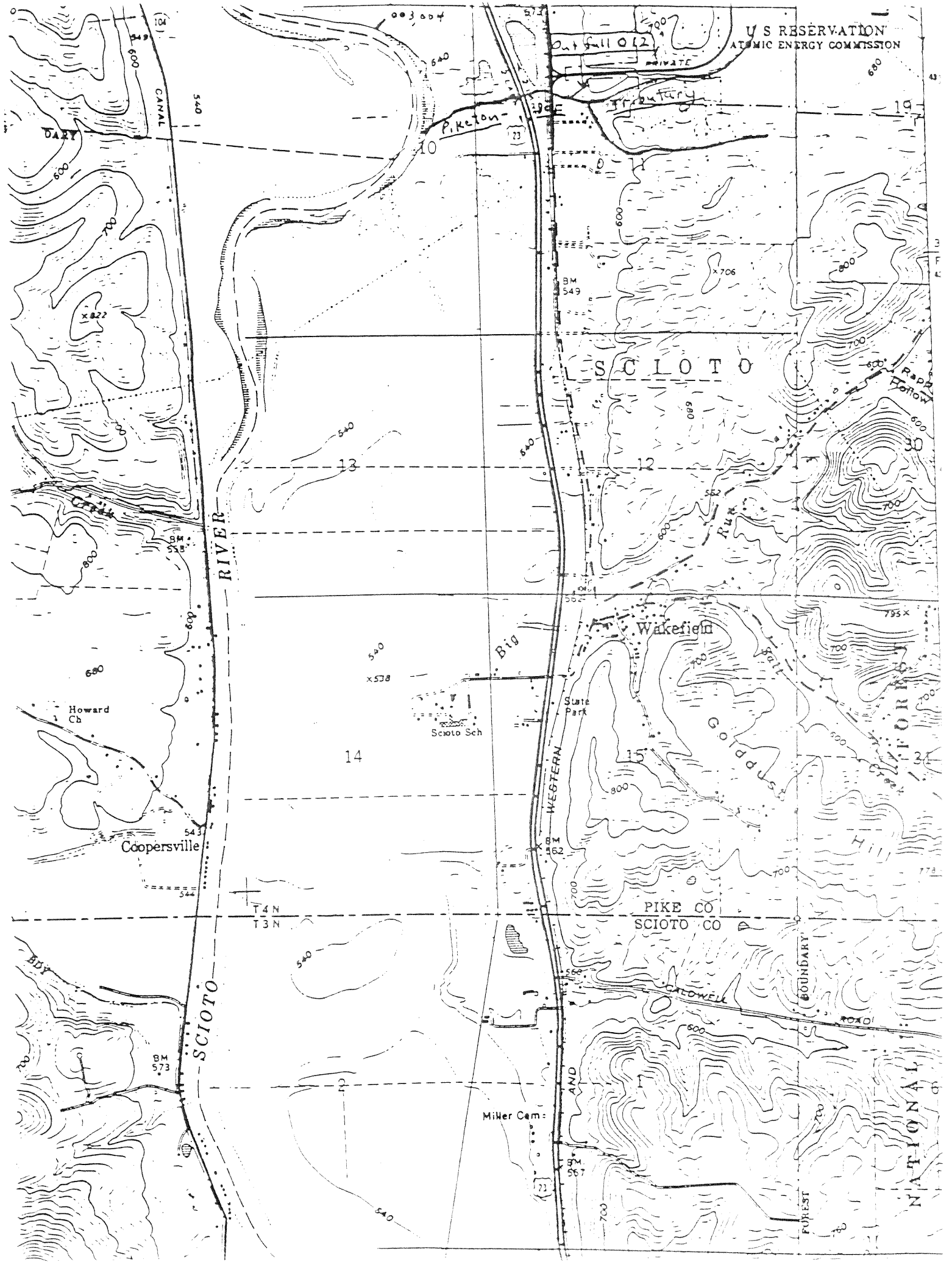
Rationale:

- Flow Regime: Piketon-DOE Tributary is depicted as an intermittent water course on the U.S.G.S. 7.5 Minute Series Topographical Map. The stream is likely dry upstream of U.S. DOE Piketon's 012 outfall except for drainage during a rainfall event. The 012 outfall provides 0.99 cfs per day of noncontact cooling water.
- Gradient: averages 67 feet/mile
- Length: 1.2 miles
- Drainage Area: approximately 1.0 square miles
- Sinuosity: approximately 1.0
- Amount of deciduous reparation vegetation: Analysis based on U.S.G.S. 7.5 Minute Series Topographical Maps revealed 92% of the stream corridor has no tree canopy. The Pike County Soil Survey has not been completed so aerial photographs and soil types are not readily available.

Piketon-DOE Tributary can not be expected to support a truly balanced reproducing warmwater biological community due to its physical characteristics. Without the cooling water from the U.S. DOE Piketon outfall, Piketon-DOE Tributary would be a typical watercourse providing drainage to the rolling terrain in Pike County during rainfall events but otherwise intermittent or dry. The watercourse is very small and has a high gradient so little or no run or pool area would be available for fish habitat, sinuosity is very low which decreases habitat suitability, and a tree canopy is generally lacking further decreasing habitat suitability and thermal stability. Therefore, habitat conditions in Piketon-DOE Tributary are not suitable to support a warmwater habitat use.

Other Use Designations

The potential for Agricultural and Industrial Water Supply Uses exist; therefore, the Piketon-DOE Tributary should be designated for these stream uses. Because this tributary is very shallow and pools of sufficient depth for full body immersion (i.e., at least 3 ft. deep over an area of 100 sq. ft., WQS Implementation Manual 1985) will not exist, Secondary Contact Recreation is the appropriate recreational use.



U.S. RESERVATION
ATOMIC ENERGY COMMISSION

SCIOTO

Waverfield

PIKE CO
SCIOTO CO

NATIONAL

BOUNDARY

FOREST

GALLOWS

Miller Cem.

State Park

Scioto Sch.

Coopersville

Howard Cb.

Big

Rapids
Hollow

Outfall 012

PRIVATE

Tributary

Pikeston

CANAL

DARY

SCIOTO
RIVER

SCIOTO

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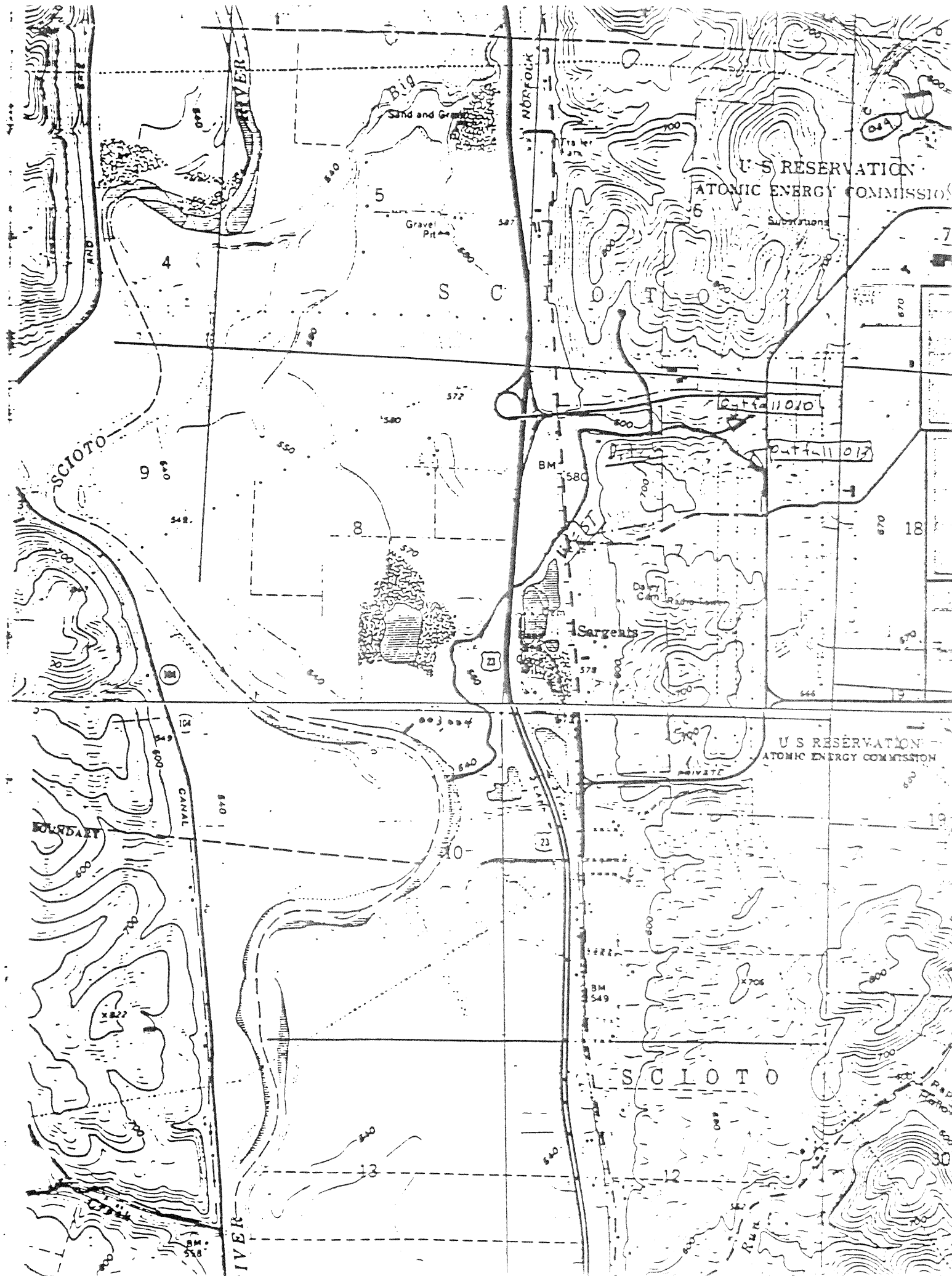
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WASTELOAD ALLOCATION FOR

USDOE PIKETON
(01000000)

APRIL 1988

PREPARED BY

Division of Water Quality Monitoring and Assessment
Ohio Environmental Protection Agency

DATE: 4/8/88

Page 1 of 7

ENTITY: USDOE Piketon (01000000) Outfall 002

DISCHARGE FLOW: 0.62 cfs (0.40 MGD)

RECEIVING STREAM: Big Run

APPLICABLE USE DESIGNATION: WH

WQS: Effective 4/30/87 and Ohio EPA Aquatic Life Water Quality Criteria

	YEAR ROUND EFFLUENT LIMITS			
	AVERAGE		MAXIMUM	
	(ug/l)	(kg/day)	(ug/l)	(kg/day)
Arsenic	190.	0.288	360.	0.546
Copper	30. ^A	0.045	43.	0.065
Nickel	82. ^B	0.124	122. ^B	0.185
Zinc	181.	0.274	708.	1.073
Total Residual Chlorine (Summer Only)	11.	-	19.	-

COMMENTS: A) Limited to Most Stringent Limit. Will require biomonitoring.

B) Limited by Antidegradation.

ANALYSIS CONDUCTED BY: Paul A. Lane

ANALYSIS REVIEWED BY: Ref. Copy

DATE: 4/8/88

Page 2 of 7

ENTITY: USDOE Piketon (01000000) Outfall 004

DISCHARGE FLOW: 1.79 cfs (1.16 MGD)

RECEIVING STREAM: Scioto River

APPLICABLE USE DESIGNATION: WWM

WQS: Effective 4/30/87 and Ohio EPA Aquatic Life Water Quality Criteria

	YEAR ROUND EFFLUENT LIMITS			
	AVERAGE		MAXIMUM	
	(ug/l)	(kg/day)	(ug/l)	(kg/day)
Chromium ⁺⁶ , Dissolved	13. ^C	0.057	17. ^C	0.074
Chromium, Total	549. ^C	2.402	667. ^C	2.918
Copper	42. ^C	0.184	55. ^C	0.241
Nickel ^A	58,173.	255.	543,143.	2,377.
Nickel ^B	-	-	6,134.	26.840.
Zinc	256. ^C	1.120	366. ^C	1.601
Chloroform ^A	16,541.	72.	343,800.	1,504.
Chloroform ^B	-	-	3,600.	15.752
Trichloroethylene ^A	15,156.	66.	313,382.	1,371.
Trichloroethylene ^B	-	-	3,400.	14.877
Total Residual Chlorine (Summer Only)	-	-	500.	-

COMMENTS: A) WLA results without application of FAV, per request of Standards and Toxics Section. Limits exceeding FAV require justification by Standards and Toxics.
B) WLA results with application of FAV
C) Limited by Antidegradation

ANALYSIS CONDUCTED BY: Mark A. Lane ANALYSIS REVIEWED BY: Sub amg

DATE: 4/8/88

Page 3 of 7

ENTITY: USDOE Piketon (01000000) Outfall 605

DISCHARGE FLOW: 0.06 cfs (0.04 MGD)

RECEIVING STREAM: Scioto River

APPLICABLE USE DESIGNATION: WWH

WQS: Effective 4/30/87 and Ohio EPA Aquatic Life Water Quality Criteria

		SEASONAL EFFLUENT LIMITS	
		MAXIMUM	
		(mg/l)	(kg/day)
NH ₃ -N	Summer	18.	2.64
	Winter (Dec-Feb)	18.	2.64

YEAR ROUND EFFLUENT LIMITS				
	AVERAGE	MAXIMUM		
	(ug/l)	(kg/day)	(ug/l)	(kg/day)
Chromium ⁺⁶ , Dissolved A	2,021.	0.296	3,503.	0.514
Chromium ⁺⁶ , Dissolved B	-	-	38.	0.006
Chromium, Total A	12,948.	1.899	719,134.	105.
Chromium, Total B	-	-	7,832.	1.149
Copper A	1,961.	0.288	7,147.	1.048
Copper B	-	-	86.	0.013
Nickel A	58,173.	8.532	543,143.	80.
Nickel B	-	-	6,134.	0.900
Zinc A	32,319.	4.740	123,606.	18.129
Zinc B	-	-	1,416.	0.208
Trichloroethylene ^A	15,156.	2.223	313,382.	45.
Trichloroethylene ^B	-	-	3,400.	0.499

Comments: A) WLA results without application of FAV, per request of Standards and Toxics Section. Limits exceeding FAV require justification by Standards and Toxics.

B) WLA results with application of FAV

ANALYSIS CONDUCTED BY: M. J. G. H. ANALYSIS REVIEWED BY: Smith and 42

DATE: 4/8/88

Page 4 of 7

ENTITY: USDOE Piketon (01000000) Outfall 604

DISCHARGE FLOW: 0.06 cfs (0.04 MGD)

RECEIVING STREAM: Scioto River

APPLICABLE USE DESIGNATION: WH

WQS: Effective 4/30/87 and Ohio EPA Aquatic Life Water Quality Criteria

	YEAR ROUND EFFLUENT LIMITS			
	AVERAGE		MAXIMUM	
	(ug/l)	(kg/day)	(ug/l)	(kg/day)
Copper	23. ^A	0.003	35. ^A	0.005
Nickel	30. ^A	0.004	44. ^A	0.006
Zinc	299. ^A	0.044	440. ^A	0.065

Comments: A) Limited by Antidegradation.

Outfalls 604 and 606 discharge to the Scioto River via Outfall 003. Due to antidegradation, the total nickel discharged from 003 must be limited to 77 ug/l average and 102 ug/l maximum.

ANALYSIS CONDUCTED BY: Paul A. Hume

ANALYSIS REVIEWED BY: Paul A. Hume

DATE: 4/8/88

Page 5 of 7

ENTITY: USDOE Piketon (01000000) Outfall 606

DISCHARGE FLOW: 0.005 cfs (0.003 MGD)

RECEIVING STREAM: Scioto River

APPLICABLE USE DESIGNATION: WWH

WQS: Effective 4/30/87 and Ohio EPA Aquatic Life Water Quality Criteria

	YEAR ROUND EFFLUENT LIMITS			
	AVERAGE (ug/l)	(kg/day)	MAXIMUM (ug/l)	(kg/day)
Cadmium A	114,886.	1.404	7,199,343.	88.
Cadmium B	-	-	212.	0.003
Chromium ⁺⁶ , Dissolved ^A	2,021.	0.025	3,503.	0.043
Chromium ⁺⁶ , Dissolved ^B	-	-	38.	0.0005
Chromium, Total ^A	12,948.	0.158	719,134.	8.789
Chromium, Total ^B	-	-	7,832.	0.096
Copper ^A	1,961.	0.024	7,147.	0.087
Copper ^B	-	-	86.	0.001
Lead ^A	2,088,830.	25.530	23,127,142.	283.
Lead ^B	-	-	684.	0.008
Nickel ^A	58,173.	0.711	543,143.	6.638
Nickel ^B	-	-	6,134.	0.075
Zinc ^A	32,319.	0.395	123,606.	1.511
Zinc ^B	-	-	1,416.	0.017
Trichloroethylene ^A	15,156.	0.185	313,382.	3.830
Trichloroethylene ^B	-	-	3,400.	0.042

Comments: A) WLA results without application of FAV, per request of Standards and Toxics Section. Limits exceeding FAV require justification by Standards and Toxics.

B) WLA results with application of FAV

Outfalls 604 and 606 discharge to the Scioto River via Outfall 003. Due to antidegradation, the total nickel discharged from 003 must be limited to 77 ug/l average and 102 ug/l maximum.

ANALYSIS CONDUCTED BY: Mark A. Hume ANALYSIS REVIEWED BY: Jeff Amy

WLA For USDOE Piketon

Limits were determined for USDOE Piketon for $\text{NH}_3\text{-N}$ and various conservative parameters. Limits for $\text{NH}_3\text{-N}$ toxicity were calculated using seasonal $Q_{30,10}$ values for the stream design flow. Limits for the conservatives were calculated to maintain the Chronic Criteria (CC) using annual $Q_{30,10}$ as the stream design flow and to maintain the Acute Aquatic Criteria (AAC) under annual $Q_{7,10}$ conditions. Per the request of the Standards and Toxics Section, the WLA results were not limited to Final Acute Values (FAV); however, for comparison, the results are also presented with the application of FAV. The WLA for total residual chlorine was calculated using summer $Q_{30,10}$ and $Q_{7,10}$ values. The data used in the WLA is listed in the following table.

Model Input

PARAMETER (ug/l)		CC	AAC	FAV	UPSTREAM	SOURCE
$\text{NH}_3\text{-N}$ (mg/l)	S	0.3	-	-	0.05	STORET
	W	5.6	-	-	0.05	STORET
Arsenic		190.	360.	720.	0.	Assumed
Cd		1.7	106.	212.	0.16	STORET
Chlorine		11.	19.	38.	0.	Assumed
Cr^{+6}		10.	19.	38.	0.	Assumed
Cr		79.	3916.	7832.	15.	STORET
Cu		13.	43.	86.	3.	STORET
Pb		30.	342.	684.	2.	STORET
Ni		324.	3068.	6134.	27.	STORET
Zn		181.	708.	1416.	16.	STORET
Chloroform		79.	1800.	3600.	0.	Assumed
Trichloroethylene		75.	1700.	3400.	0.	Assumed